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<b>(51) International Patent Classification <sup>6</sup> :</b> <b>G07F 7/10, 9/08</b>	<b>A1</b>	<b>(11) International Publication Number:</b> <b>WO 97/36265</b> <b>(43) International Publication Date:</b> 2 October 1997 (02.10.97)
<b>(21) International Application Number:</b> PCT/NL97/00160 <b>(22) International Filing Date:</b> 27 March 1997 (27.03.97) <b>(30) Priority Data:</b> 1002733 28 March 1996 (28.03.96) NL <b>(71)(72) Applicant and Inventor:</b> VRIEND, Gerrit [NL/DE]; Mey- erhofstrasse 1, D-69117 Heidelberg (DE). <b>(74) Agent:</b> VAN BREDA, Jacques; Octrooibureau Los en Stijger B.V., Weteringschans 96, NL-1017 XS Amsterdam (NL).		<b>(81) Designated States:</b> CA, US, European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).  <b>Published</b> <i>With international search report.</i> <i>Before the expiration of the time limit for amending the</i> <i>claims and to be republished in the event of the receipt of</i> <i>amendments.</i> <i>In English translation (filed in Dutch).</i>
<b>(54) Title:</b> INFORMATION NETWORK AND AN ELECTRONIC CARD USABLE THEREIN  <b>(57) Abstract</b>  The invention relates to an information network comprising a control and information unit, at least one data channel, and a number of detached card readers connected with the control and information unit via a data channel, which card readers are suitable for the exchange of information with an electronic card to be inserted into such a card reader, wherein the data channel between the card readers and the control and information unit consist, at least in part, of the electronic card. The electronic card is provided with a memory for the storage of messages from and to the detached card readers. Part of the memory is reserved for storage and transport of information deviating from the object information of the electronic card, and be addressable to at least one of the card readers.		

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Information network and an electronic card usable therein

The invention relates to an information network comprising a control and information unit, at least one data channel, and a number of detached card readers connected with the control and information unit via a data channel, which card readers are suitable for the exchange of information with an electronic card to be inserted into such a card reader, wherein the data channel between this detached card reader and the control and information unit consists, at least in part, of the electronic card, and the electronic card is provided with a memory for the storage of messages from and to the detached card readers.

WO 96/08798 discloses a system for the control of game machines comprising a smart card reader with which transactions can be carried out. Such a smart card is used as playing card and is provided, by means of a separate device, with playing information and a balance. In addition, a central management and security unit is provided to which a card reader is connected. The control and information unit is fed with the playing cards and is generally equipped as secured system for the control of the game machines.

EP-A 0 360 613 discloses a data transmission system for a game machine which also uses a smart card provided with a memory and a processor. The card provides the necessary address and storage functions. This card can further be read in via a card reader at the separately placed game machines. In addition, a central control and information unit is provided by which means the card can be read. When the card returns to a central location to be processed by a central processor, relevant information is obtained from the card and centrally processed further.

There also is a system known in practice, in which by means of electronic cards payments are made in shops and other transaction centres. To make the payment, the electronic card is inserted into the card reader in order to have the information which is electronically stored on the card, read. After the communication link between the

card reader and the control and information unit is established, this information is sent to the control and information unit to select the bank account of the holder of the card being read while, to have the balance of the bank account unblocked, usually also an electronic signature in the form of a personal identification code has to be entered. This latter code is also provided on the electronic memory of the card with which it is compared, for the benefit of said authorization function.

10        Nowadays advanced electronic cards are being introduced which are provided with electronic circuits in the form of one or more chips. Due to provisions in the card reader such electronic cards are able to exchange information. Known are the so-called memory cards and  
15 smart cards; these are available as contact and blank contact cards. These cards serve for identification, payment and other purposes and are standardized in accordance with, among others, ISO/NEN 7816 and ISO 10536.

      In addition to the information network, the present  
20 invention relates in particular to those electronic cards which allow multiple information exchange.

The invention proposes that part of the memory on the electronic card be reserved for storage and transport of information deviating from the object information of the electronic card, and be addressable to at least one of the card readers. In this way it will be possible, according to the invention, to exchange information even with the detached card readers not directly connected with the control and information unit, due to their being part of a  
25 virtual data network comprised of the successive electronic cards which are inserted into the card readers.  
In this way, for instance, actual status information relating to the card readers is able to reach the control and information unit, while the possibility is created to  
35- up-date data in the card readers, because this information reaches the card readers by means of transport with the electronic cards which are inserted into the card readers.

      It is desirable that the network comprises at least one card reader, which is continuously, or at least

temporarily but repetitively directly connected with the control and information unit by means of a physical data channel. Such a directly connected card reader provides the data input and output unit by which information  
5 exchange between the electronic card and the control and information unit can take place.

Card readers possessing such a direct non-temporary or temporary but repetitive connection with the control and information unit are, for instance, pay telephones,  
10 cash dispensers, point of sale terminals and the like. Detached card readers are known in the form of vending machines, parking meters, gambling machines and the like.

In this way the information network proposed according to the invention can be made cheaper than the  
15 known information network comprising non-temporary or temporary but stationary data channels.

The electronic cards are able to store failure and status data from the detached card readers. Via the virtual data network, a maintenance indication regarding a  
20 detached card reader can thus reach the control and information unit without physical control by a technician, after which appropriate action can be taken.

In a further aspect of the invention the control and information unit feeds the same information to several  
25 electronic cards in succession. In this way the supply of information to a detached card reader to be addressed, is less dependent on the regular use of the electronic card employed in the system, so that, statistically, there will always be an electronic card ensuring directly or  
30 indirectly that the necessary information arrives at the intended destination. An additional advantage is that detached card readers receiving information via an electronic card which is not intended for this reader, will load the respective information onto one or more  
35 successive electronic cards which are inserted into this card reader to pass on the information, in order to advance the arrival of this information at the intended destination.

Another desirable provision in respect of the information network according to the invention is that at least a detached card reader is able to collect and to electronically label inserted electronic cards for instance, to selectively invalidate them in reaction to information which has reached the respective card reader from the control and information unit. By spreading the respective data via the virtual network, electronic cards that perhaps have been stolen can be traced quickly, after which the necessary further action can be taken such as alerting the police and the like.

In a preferred embodiment of the information network according to the invention one or more card readers are provided with audio visual means for the display of information coming from the control and information unit and sent via data channels which connect these card readers with the control and information unit. In this way it is also possible for detached card readers to exchange information via the respective audio visual means with a card user pertaining to commercials which may be intended for persons or target groups.

The information network according to the invention makes the efficient and effective distribution of information possible between, and to, card readers having a direct connection with the control and information unit and also card readers which do not have such a direct connection, but are detached.

The invention further makes it possible to employ the information network in various applications, as will be elucidated by means of the following, non-limiting examples.

#### EXAMPLE 1

Via an electronic card a detached card reader, such as a parking meter, receives information from a central control and information unit. The information relates to exchange rates, price changes, holidays on which a different tariff applies, change from summer to winter time and vice versa. The information reaches the card reader via

other card readers maintaining a direct connection with the control and information unit, and which write to disk the respective information on the electronic cards that have been inserted into directly connected card readers.

5

#### EXAMPLE 2

A detached card reader connected with a vending machine, for instance, a cigarette vending machine, feeds a central management system via electronic cards which are inserted into the card reader. The information communicated relates to balance, failure report, stock status. The information on the electronic cards reaches the management system via other card readers maintaining a direct connection with that management system.

15

#### EXAMPLE 3

A card reader which is provided with audiovisual means displays messages to the card user, for instance, commercial messages. Possible special marketing actions, such as special offers may be brought to the attention of, and possibly focused on, the respective card user. The communicated information may be provided with a maximum period of validity to prevent presentation of this information after the date of validity.

25

#### EXAMPLE 4

Provided the respective law concerning chance games is complied with, at certain points of transaction involving card readers a chance game might be offered by, for instance, attaching to a transaction the chance of winning a certain amount of money which will be automatically credited on the electronic card while possibly, in exchange, a certain amount of money is debited on the electronic card to pay for the participation in the chance game.

35

#### EXAMPLE 5

In an information network equipped with a control and information unit and card readers directly connected

with the control and information unit as well as detached card readers, management information is exchanged, in particular between detached card readers and the control and information unit, by means of the electronic cards  
5 employed in the information network. This information may relate to the issue of failure reports, statistic user information relating to a card reader, balance status, and the distribution of data relating to invalid electronic cards.



CLAIMS

1. An information network comprising a control and information unit, at least one data channel, and a number of detached card readers connected with the control and information unit via a data channel, which card readers  
5 are suitable for the exchange of information with an electronic card to be inserted into such a card reader, wherein the data channel between this detached card reader and the control and information unit consists, at least in part, of the electronic card, and the electronic card is  
10 provided with a memory for the storage of messages from and to the detached card readers, characterized in that part of the memory on the electronic card be reserved for storage and transport of information deviating from the object information of the electronic card, and be  
15 addressable to at least one of the card readers.

2. An information network in accordance with claim 1, characterized in that the network comprises at least one card reader which is continuously, or at least temporarily but repetitively directly connected with the  
20 control and information unit by means of a physical data channel.

3. An information network in accordance with claim 1 or 2, characterized in that at least one card reader is provided with audio visual means for the display of  
25 information coming from the control and information unit and sent via the data channel which connects this card reader with the control and information unit.

4. An information network in accordance with any one of the preceding claims, characterized in that the  
30 control and information unit feeds the same information to several electronic cards in succession.

5. An information network in accordance with any one of the claims 1-4, characterized in that detached card readers receiving information via an electronic card which  
35 is not intended for this reader, will load the respective

information onto one or more successive electronic cards in order to be further routed.

6. An information network in accordance any with one of the claims 1-5, characterized in that at least a  
5 detached card reader is able to collect and to electronically label inserted electronic cards in reaction to information which has reached the respective card reader from the control and information unit.

7. An electronic card as described as part of the  
10 information network in accordance with any one of the claims 1-6.

# INTERNATIONAL SEARCH REPORT

Inter. Application No.  
PCT/NL 97/00160

A. CLASSIFICATION OF SUBJECT MATTER  
IPC 6 G07F7/10 G07F9/08

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)  
IPC 6 G07F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 96 08798 A (GEMPLUS) 21 March 1996 cited in the application see abstract; claims; figures see page 5, line 24 - page 10, line 27 ---	1-3,7
A	EP 0 360 613 A (BALLY MANUFACTURING CORPORATION) 28 March 1990 cited in the application see the whole document ---	1,2,7
A	WO 96 07164 A (GEMPLUS) 7 March 1996 see abstract; claims; figures ---	1,6
A	EP 0 555 683 A (PAYTRON) 18 August 1993 ---	
A	DE 93 13 736 U (SIEMENS) 20 January 1994 ---	
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☒ Patent family members are listed in annex.

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Date of the actual completion of the international search

21 July 1997

Date of mailing of the international search report

29. 07. 97

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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Information on patent family members

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